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Monograph of the Family TEREDIDÆ.

BY GEORGE W. TRYON, JR.

The following is the third and concluding paper of a series,* designed to comprehend all that is at present known, regarding the curious group of shells included in Blainville's Order Pholadacea:—

In the preparation of these papers much difficulty has arisen from the number of species which have been described (sometimes inadequately) but not figured, and from the conflicting views of European naturalists regarding the validity of many species. There is no good reason why the Pholadacea should not be searched for, and distributed very generally in public and private cabinets, yet such is not the case, and every conchologist who studies the order labors under the disadvantage of being unable to examine and compare specimens, of a large number of the species. Greatly as the number of species have been increased by modern research, it is evident, from the general diffusion of the order throughout the world, and from the incompleteness of our researches in those regions, which appear most to abound in them, and also from the number of new species in one of the families discovered recently in England alone, that the number at present known must be indeed a very small proportion of those which future investigations will probably reveal to us.

If these pages shall direct attention to the collection and study of the Pholadacea, and furnish an approximate idea of the amount of the previous labors of conchologists, they will have answered their purpose. Should *matériel* be placed at my disposal for a more perfect study of these shells, a complete illustrated monograph will be published at some future time. To further this end, collectors are earnestly requested to send to me (in exchange), specimens from all duly authenticated localities, together with such facts in relation to them as may come to their knowledge, and such assistance will be fitly acknowledged in the proposed publication.

Sellius was the first naturalist who studied the species of *Teredo*, and his work on their natural history is a model of accuracy in most particulars, going far in advance of all other treatises on the subject which appeared for many years afterwards.

So little did Linnæus and his immediate followers know of the species of *Teredo*, that they included a number of species under the name of *T. navalis*, which is published with such a general description as will suit all the species now known, or hereafter to be added to the genus! Lamarck did not add much to our knowledge of these shells, and Dr. Gray has merely given us at two widely-extended periods, lists of the species, one or two descriptions, and some interesting and important investigations regarding the shell of *Kuphus arenarius*. Conchology is deeply indebted to the following naturalists for a large portion of our knowledge of the family: Blainville, who published a number of new species in the "Dict. des Sciences Naturelles." Deshayes, who has given us extended anatomical descriptions in the Mollusca of the Scientific Exploration of Algiers. Fischer, a Monograph of the family in "Journ. Couch., 2 ser., vol. i." Turton, for several new species. And more especially to Mr. Gwyn Jeffreys for his accurate diagnoses of new British species, and to Mr. Hanley for the splendid descriptions which he has published in the "History of British Mollusca."

I have endeavored, as far as possible, in the present paper to separate the species by distinctive characters, but their value is seriously impaired in this family by the fact that, unlike the Pholadidæ, the specific distinctions are not

* "Synopsis of the Recent Species of Gastrochaenidæ, a Family of Acephalous Mollusca."—Proc. Acad. Nat. Sc., Dec., 1861.

"On the Classification and Synonymy of the Recent Species of Pholadidæ."—Proc. Acad. Nat. Sc., April, 1862.

always founded on the shell, but sometimes, where the shells of two species are undistinguishable from each other, their tubes or pallets may afford considerable differences. The pallets alone as will be seen indicate two distinct genera, where the valves do not differ. Hence it is necessary, in many cases, for a certain determination of the species, that the valves, tube, and pallets shall each be examined, and it is needless to expatiate on the confusion which would arise from the accidental commingling of the tubes or pallets of one species with the valves of another; and this confusion is more apt to occur when, as is not unfrequently the case, several species are found inhabiting the same piece of wood, and being broken in their extraction, the pallets and valves fall out indiscriminately intermingled.

Another difficulty in the study of the Teredidæ is the great variation of the individuals in size, proportions, and markings, making an accurate diagnosis a simple impossibility, and compelling us to rely on a *general accordance* with descriptions in the most material points. Mr. Hanley remarks that "there is one fact with regard to the shipworms, which has rendered their investigation peculiarly laborious, namely, that no reliance can be placed upon the relative proportions of their several parts for specific definition. If we take at random about fifty valves of *Norvagia*, for instance, we shall find that in some the oblique decussated striæ occupy twice the space of the succeeding strip, in others this is reversed, in many these are both contracted, and a large posterior smooth area is exhibited; in others again almost the entire surface is occupied by the two former, to the great diminution of the hinder portion. Hence it is absolutely necessary to examine very numerous examples in order to elicit the real and permanent specific characters, and the valves alone are rarely adequate for the determination of the species."

Dr. Gray proposed, in 1851, to consider the Teredines a subfamily of PHOLADIDÆ, but Mr. P. P. Carpenter has separated them under the name of TEREDIDÆ, with great propriety, as they undoubtedly exhibit sufficient differences from the Pholades, and from all other Mollusca, to be entitled to the position of a family.

I have already given (in Proc. A. N. S., April, 1862) a sketch of the division of TEREDIDÆ into three subfamilies, which it will be necessary to reproduce here:—

Family TEREDIDÆ.

Animal elongate, subcylindrical, siphons united nearly to the end, their extremities armed with two shelly styles; (Pallets.) foot long and narrow, protruded through the united mantle lobes, which are thickened in front. Gills long; mouth with palpi. Shell, when present, globular, tripartite, included with the animal in a more or less cylindrical testaceous tube, the siphonal end of which is divided into two by a longitudinal partition.

Subfamily 1. TEREDINÆ. Valves present, free, contained in the tube, which is irregularly cylindrical, sometimes much contorted. Perforating timber.

Subfamily 2. TEREDININÆ. Valves with an accessory anterior dorsal plate, their margins prolonged into a shelly tube when adult.* Tube frequently concamerated; siphonal extremity often truncate, and the opening contracted by a six-lobed internal margin (*fossil*).

* Dr. Gray supposes the fossil genus TEREDINA to be more closely connected with PHOLADIDÆ than with TEREDIDÆ, from the fact that the shell has an accessory dorsal plate, and is external to the tube. It must be confessed that the genus is curiously related to all three families; the external position of the valves, and the lobed end of the tube, exhibiting an approach to the GASTROCHÆNIDÆ. I have concluded to place it for the present in TEREDIDÆ, in a position where it may indicate a transition from the free and perfect valves of TEREDO, through its less important valves eventually becoming merely a portion of the tube, to the KUPHUS, where the valves are entirely wanting, or are replaced by the cleft shelly plate which closes the lower end.

Subfamily 3. KUPHINÆ. Without valves. Tube clavately cylindrical, sunk horizontally in sand. Never penetrating timber.

Synopsis of Genera.

Subfamily TEREDINÆ.

Tubes elongate, nearly cylindrical, increasing slowly in diameter, solitary; pallets simple; valves generally nearly as broad as their length.....Genus *TEREDO*, Linn.

Tubes club-shaped, much contorted, growing together in masses, and increasing rapidly in diameter; pallets simple; valves narrow and elongate.....Genus *UPEROTIS*, Guettard.

Tubes elongate, increasing slowly in diameter, solitary; pallets compound, the blade penniform, composed of a number of jointed setæ; valves nearly as broad as their length.....Genus *XYLOTRYA*, Leach.

Subfamily TEREDINIDÆ.

(*Fossil.*)

Subfamily KUPHINÆ.

Tubes penetrating sand, somewhat irregular, very large, "pierced around the base with small scattered perforations; and inclosed by two overlapping convex septa, arising from the sides and completely closing the ends" (*Gray*)....Genus *KUPHUS*, Guettard.

Index to Species of TEREDINÆ.

Bruma delle Navi, Vallisnieri, = *Teredo Norvagica*, Spengler.

dell' Oceano, Vallisnieri, = *Teredo megotara*, Hanley.

Cuphus arenarius, Gray, = *Kuphus arenarius*, Linn.

Dentalium navis, Linn. = *Teredo navalis*, Linn.

Fistulana corniformis, Lam. = *Teredo Norvagica*, Spengler.

gregaria, Blainv. = *Uperotis clava*, Gmelin.

gregata, Lam. = *Uperotis clava*, Gmelin.

Furcella gigantea, Gray, = *Kuphus arenarius*, Linn.

Guetera clava, Gray, = *Uperotis clava*, Gmel.

corniformis, Gray, = *Teredo Norvagica*, Spengler.

Kuphus arenarius, Linn.

Leptana arenaria, Gray, = *Kuphus arenarius*, Linn.

Pholas Teredo, Müll. = *Teredo nana*, Turton.

Septaria arenaria, Lam. = *Kuphus arenarius*, Linn.

gigantea, Chenu, = *Kuphus arenarius*, Linn.

Mediterranea, Matheron, = *Teredo Norvagica*, Spengler.

Serpula anguina, b. Gmelin, = *Kuphus arenarius*, Linn.

gigantea, Schröter, = *Kuphus arenarius*, Linn.

polythalamia, Linn. = *Kuphus arenarius*, Linn.

retorta, Mawe, = *Uperotis clava*, Gmelin.

Teredo, Da Costa, = *Teredo Norvagica*, Spengler.

Solen arenarius, Rumphius, = *Kuphus arenarius*, Linn.

corrugatus, Klein, = *Kuphus arenarius*, Linn.

Teredo arenaria, Gray, = *Kuphus arenarius*, Linn.

Teredo Batavus, Spengler, = *Teredo navalis*, Linn.

Teredo bipalmulata, Chiaje, = *Xylotrya minima*, Blainv.

" Lam. = *Xylotrya palmulata*, Lam.

" Thompson, = *Xylotrya fimbriata*, Jeffreys.

bipartita, Jeffreys.

- Teredo Bruguerii*, Chiaje, = *Teredo Norvagica*, Spengler.
campanulata, Desh. = *Xylotrya Stutchburyi*, Leach.
carinata, Leach, = *Xylotrya bipennata*, Turton.
clava, Gmel. = *Uperotis clava*, Gmel.
corniformis, Gray, = *Teredo Norvagica*, Spengler.
denticulata, Gray, = *Teredo nana*, Turton.
Deshaii, Quatref. = *Teredo Norvagica*, Spengler.
dilatata, Stimpson.
divaricata, Desh.
elongata, Quatref.
excavata, Lukis.
fatalis, Quatref. = *Teredo Norvagica*, Spengler.
fusticulis, Jeffreys.
gigantea, Home, = *Kuphus arenarius*, Linn.
gregata, Desh. = *Uperotis clava*, Gmel.
malleolus, Turton.
marina, Sellius, = *Teredo navalis*, Linn.
Mediterranea, Catlow, = *Teredo Norvagica*, Spengler.
megotara, Hanley.
minima, Blainv. = *Xylotrya minima*, Blainville.
nana, Turton.
 " (*part.*) Gray, = *Teredo megotara*, Hanley.
navalis, Brit. Authors, = *Teredo Norvagica*, Spengler.
 " Home, = *Xylotrya bipennata*, Turton.
 " Linn.
 " Möller, = *Teredo nana*, Turton.
 " Spengler, = *Xylotrya Stutchburyi*, Leach.
navium, Sellius, = *Teredo Norvagica*, Spengler.
nigra, Blainv. = *Teredo Norvagica*, Spengler.
Norvagica, Thompson, = *Teredo Norvagica*, Spengler.
Norvagica, Spengler.
 " *var.* Jeffreys, = *Teredo divaricata*, Desh.
nucivorus, Spengler, = *Uperotis clava*, Gmel.
Oceani, Sellius, = *Teredo megotara*, Hanley.
palmulata, Leach, = *Xylotrya pennatifera*, Blainv.
 " Lam. = *Xylotrya palmulata*, Lam.
 " Philippi, = *Xylotrya minima*, Blainv.
pedicellata, Quatref.
pennatifera, Blainv. = *Xylotrya pennatifera*, Blainv.
Petitii, Recluz, = *Teredo elongata*, Quatref.
Philippii, Gray, = *Xylotrya minima*, Blainv.
Senegalensis, Blainv.
 " Fischer, *Teredo elongata*, Quatref.
 " Laurent, = *Teredo Norvagica*, Spengler.
serratus, Desh. = *Xylotrya minima*, Blainv.
spatha, Jeffreys.
Stutchburyi, Leach, = *Xylotrya Stutchburyi*, Leach.
subericola, Macgillivray.
thoracites, Gould.
truncata, Quatref.
utriculus, Gmel. = *Teredo Norvagica*, Spengler.
vulgaris, Lam. = *Teredo navalis*, Linn.
Uperotis clava, Gmel.
corniformis, Adams, = *Teredo Norvagica*, Spengler.
Xylotrya bipalmulata, Lam. = *Xylotrya palmulata*, Lam.
bipennata, Turton.
carinata, Gray, = *Xylotrya bipennata*, Turton.

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- Xylotrya fimbriata*, Jeffreys.
cucullata, Norman.
minima, Blainv.
palmulata, Hanley, = *Xylotrya fimbriata*, Jeffreys.
 " Lam.
pennatifera, Blainv.
Philippii, Adams, = *Xylotrya minima*, Blainv.
Stutchburyi, Leach.

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Synonymy and Descriptions.

Order PHOLADACEA.

(Family 1. *PHOLADIDÆ*.)

(Family 2. *GASTROCHÆNIDÆ*.)

Family 3. *TEREDIDÆ*, Carpenter.

TEREDIDÆ, Carpenter, Lectures on Mollusca, p. 100.

Teredina, (part.) Sieb. Lehrb. vgl. Anat., p. 235.

Teredinadæ, (part.) Fleming, Hist. Brit. Anim., p. 454.

Teredinidæ, (part.) Fleming, Hist. Brit. Anim., p. 409.

Pholadidae, (part.) Gray, Zool. Proc., 1847, p. 187. Gray, Ann. and Mag. Nat.

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Pholadarie, (part.) Latreille, Fam. Nat.
Pholadea, (part.) Anton, Versuch., p. 1. Menke, Synopsis, p. 121, 2d edit.
Pholadeæ, (part.) Menke, Syn., p. 73, 1st edit.
Pholades, (part.) Ferussac, Tabl. Syst.
Pholadina, (part.) Milne-Edwards, Conch., p. 203.
Pholadoideæ, (part.) Agassiz, Nomenclator Zool.
Pholadria, (part.) Sism., Syn. An. Foss.
Pholedarieæ, (part.) Brown, Syst. urw. Conch.
Pholideæ, (part.) Swainson, Elements et Malacology.
Pholidæa, (part.) Leach, teste Swainson, Malacology.
Adesmacea, (part.) Blainville, Malacol., p. 577.

Subfamily 1. TEREDINÆ, Tryon.

TEREDINÆ, Tryon, Proc. Acad. Nat. Sciences, p. 193, April, 1862.

Teredina, (part.) Gray, Zool. Proc., 1847, p. 188.*Teredinina*, (part.) Gray, Ann. and Mag. Nat. Hist., 2d ser. viii. p. 386.*Teredinincæ*, (part.) Adams, Genera, ii. p. 331. Chenu, Man. Conchyl. ii. p. 10.

Genus TEREDO, Linnæus.

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- Serpula*, Da Costa, Brit. Shells, p. 21.
- Fistulana*, (part.) Lamarck, Anim. sans. Vert., v. p. 438; id. 2d edit., vi. p. 35. Blainville, Dict. Sc. Nat., xvii. p. 82. Blainville, Mal., p. 579. Favanne, Conchyl. Chenu, Man. Conchyl., ii. p. 12.
- Guetera*, (part.) Gray, Ann. and Mag. Nat. Hist., 2d ser., viii. p. 361.
- Uperotis*, (part.) Adams, Genera, ii. p. 333.
- Bruma*, Vallisnieri, Op. Phys. Med., ii.
- Pholas*, (part.) Müller, Prodr. Zool. Dan., p. 251. Fabricius, Fauna Groen., p. 427.
- Dentalium*, (part.) Linnæus, Faun. Suec. 380.
- Ligniperda*, Sellius.
- Xylophagus*, Gronovius, Zooph. p. 258. Sellius.
- Solen*, Klein, De Tub.
- Siphonium*, (part.) Browne.

Species.

a. *Valves externally smooth and glossy, or regularly transversely striated.*

T. bipartita, Jeffreys.

T. bipartita, Jeffreys, Ann. and Mag. Nat. Hist. 3d ser. vi. p. 123.

Hab.—"In cedrela odorata (or West India Cedar.), thrown ashore, perhaps by the gulf stream, at Guernsey, with *T. spatha*."—*Jeffreys*.

Description.—"Tube ———? valves oval, thin, compressed, covered with a brownish epidermis; body smooth and glossy; anterior auricle moderately developed, angle rather obtuse, striæ very numerous and crowded; posterior auricle rounded, small but prominent, appressed to body, apex placed below the crown, internal margin indistinct; fang narrow and pointed; tubercle small; apophysis narrow. Pallels resembling those of *T. pedicellata*, but longitudinally divided into two equal parts by a deep furrow; stalk cylindrical, rather longer than pallet.

Dimensions.—"Length (of valves) 4-20ths; breadth 3-20ths."—*Jeffreys*.

T. excavata, Lukis.

T. excavata, Lukis, MSS. Jeffreys, Ann. and Mag. Nat. Hist. 3d ser. vi. p. 123.

Hab.—"In drift fir. Guernsey and Sussex. Rare."—*Jeffreys*.

Description.—"Tube short, rather solid, and detached from the wood, slightly curved, jointed at intervals, with a very few transverse wrinkles at the opening, and an indistinct siphonal ridge. Valves roundish oval, thin, compressed; 1862.]

body glossy, marked with distant, but regular and fine, striæ or impressed lines; anterior auricle placed nearly at a right angle with the insertion of the fang, striæ rather numerous and waved; posterior auricle dilated and somewhat reflected, apex nearly on a level with the crown or umbo of the valve, inner margin free and well defined; tubercle slight, and not visible when the valve is in a supine position; fang obtuse; apophysis thin and narrow. Pallets long and narrow, bifid in front to nearly half their length, with two corresponding tubular cavities which terminate in separate points like the prongs of a steel fork; underneath they are abruptly sloped towards the bifurcate points, and closely striated in a longitudinal direction; stalks near as long as pallets, pointed at one end and at the other merging into the pallets.

Dimensions.—Length (of valves) 7-20ths; breadth 4-20ths."—*Jeffreys*.

T. fusticulus, *Jeffreys*.

T. fusticulus, *Jeffreys*, *Ann. and Mag. Nat. Hist.* 3d ser. vi. p. 125.

Hab.—In *Cedrella odorata* from Leith.

Description.—"Tube short and straight, with a slight calcareous lining, which is not easily separated from the wood. It is thickened internally at the opening, and has a few transverse wrinkles in that part.

Valves round, thin, compressed, body smooth, glossy, white under a brown epidermis; anterior auricle of moderate size, angle about 50°, striæ numerous; posterior auricle round expanded and appressed to body, internal edge well defined; fang broad, obtuse; tubercle small and sunk; apophysis thin and narrow. Pallets club-shaped, formed of several transverse layers, and externally tuberculate; stalk twice the length of pallet.

Dimensions.—Length (of valve) 4-20ths; breadth nearly as much."—*Jeffreys*.

T. spatha, *Jeffreys*.

T. spatha, *Jeffreys*, *Ann. and Mag. Nat. Hist.* 3d ser. vi. p. 124.

Hab.—With *T. bipartita*, in *Cedrella odorata*, at Guernsey.

Description.—"Tube rather long and flexuous, detachable, regularly jointed, increasing rapidly from the extremity, inside which there are a few transverse wrinkles and a sharp, but short, siphonal ridge.

Valves, triangular, compressed, rather solid; body smooth; anterior auricle large, angle about 50°, striæ exceedingly numerous and fine; middle area unusually large and rounded and appressed, internal margin indistinct; fang narrow and pointed; tubercle small and sunk; apophysis narrow. Pallets spade-shaped, in the young state calyciform; stalk of the same length as pallet.

Dimensions.—Length (of valves) 6-20ths; breadth nearly as much. A pair of pallets is in the British Museum, from Miss Saull; and another pair is in the collections of Natural History at the Jardin des Plants. The localities of both the last-mentioned specimens are unknown."—*Jeffreys*.

T. subericola, *Macgillivray*.

T. subericola, *Macgillivray*, *Mss. Jeffreys, Ann. and Mag. Nat. Hist.* 3d ser. vi. p. 122.

Hab.—Great Britain.

Description.—Tube rather thin, and adherent to wood, short, of the form of an elongated cone curved at the opening, with internal irregular transverse septa, which are close-set at the extremity.

Valves oval, rather convex, thin; body smooth and somewhat glossy; anterior auricle short, angle obtuse, striæ rather numerous; posterior auricle narrow, falciform, reflected at the outer edge, with its apex raised above the crown; tubercle strong and prominent; fang long, narrow, and incurved; apophysis rather broad. Pallets short, pear-shaped, compressed, and expanded towards the anterior margin, with a semilunar depression in the middle and a longitudinal groove in front; stalk short and pointed.

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Dimensions.—Length (of valves) 5-20ths, breadth 4-20ths. The embryonic state of some of the specimens which occur living in cork, as well as the nature of the material, induce me to consider this species indigenous. The posterior auricle is so small in comparison with that of *T. megotara*, that Dr. Lukis proposed the name of “microtara” for this species. Specimens in cork are frequently encysted.—*Jeffreys*.

b. *External surface of the valves ornamented by a narrow radiating area with crowded sculptured lines.*

* *Pallets.*

Blade spatulate, truncate at the end. Concave on one side, convex on the other. Tube concamerated.	}	Norvagica.
Blade spatulate, truncate at the end. Concave on one side, convex on the other. Tube?		Senegalensis.
Blade spatulate, truncate at the end. Concave on one side, blade very short. Tube concamerated,	}	divaricata.
Blade spatulate, but the sides incurved in the middle, end margin concave. Tube not concamerated,		navalis.
Somewhat hastate, but truncate and heart-shaped at the end. Tube not concamerated	}	megotara
Angularly ovate, dilating into a broad blade, abruptly truncate. Tube not concamerated		nana.
Transverse, end margin sinuous, stalk deflected at an angle from the plane of the blade. Tube not concamerated	}	dilatata.
Palæform, dilated, profoundly emarginate at the end. Tube?		malleolus.
Obliquely truncate, tridentate and serrate at the end. Tube?	}	elongata.
Narrow, long, colored, stalk white. Tube not concamerated		truncata.
	}	pedicellata.

** *Valves.*

Posterior auricle broad, towering above the beaks, its basal edge situated lower than that of the anterior area	}	megotara
		nana.
Posterior auricle broad, not extending above the beaks, its basal edge situated lower than that of the anterior area	}	navalis
		pedicellata
Posterior auricle broad, not extending above the beaks, its basal edge even with that of the anterior area	}	dilatata.
		Norvagica.
Posterior auricle narrow, apex extending above the beaks, the lower edge even with that of the anterior area	}	malleolus.
Posterior auricle narrow, apex not extending above the beaks, the lower edge even with that of the anterior area		divaricata.

The above table of distinctive characters must be used with extreme caution, as individuals of the various species sometimes occur which do not well accord with their characters as given therein.

Several East Indian species are but partially included, because the descriptions are not sufficiently accurate for the arrangement of their valves.

T. elongata, Quatrefages.

T. elongata, Quatrefages, Ann. Sc. Nat. 3d ser. xi. p. 33. Adams, Genera, ii. p. 333. Fischer, Journ. de Conchyl. 2d ser. i. p. 133. Jeffreys, Ann. and Mag. Nat. Hist. 3d ser. vi. p. 126.

T. Senegalensis, Fischer, Mel. Conchyl. p. 19, t. 4, f. 2—6.

1862.]

T. Petiti, Recluz, Rev. et Mag. Zool. 2 ser. i. p. 64.

Hab.—Indian Ocean.—*Eydoux and Souleyet*.

East coast of Africa.—*Webbe*.

Description.—"Coquille assez solide, allongée, à angle antérieur très ouvert (95° — 100°); oreillette antérieure courte; postérieure étroite, allongée, non relevée; sommet tronqué avec une légère crête horizontale dépassant la callosité de la charnière et située au-dessus; apophyse styloïde mince; palettes obliquement tronquées, bicuspidées; tube fragile."—*Fischer*.

Recluz thus describes *T. Petiti*.

"*T. palmulis duabus rectis, palæformibus; latere dilatato, profundè emarginato; dentus obtusiusculis; tubo brevi, cylindrico-conico, vix arcuato; posticè supernè ac infernè emarginato, lateraliter angulis binis producto.*"

"*Hab.* trouvé par W. Webbe dans un morceau de palmier venant du haut de la rivière de Grand-Bassam (côte ouest d'Afrique), et envoyé à M. Petit de la Saussaie, qui a bien voulu nous permettre de le décrire.

"Coquille subglobuleuse, échancrée à la partie antéro-inférieure d'un peu plus du quart de son volume. Les valves sont plus hautes que langues, courbées en arc, auriculées supérieurement à leur côté antérieur et brusquement atténuées en pointe à l'inférieur; convexes en dehors, concaves en dedans et auriculées, en avant et en arrière. Auricules antérieures anguleuses, profondément striées longitudinalement (transversalement Lk.), avec les lignes élevées, croisées en arrière. Auricules postérieures ascendantes à la marge et subtronquées. Le centre des valves divisé en deux parties par un large sillon vertical orné de stries arquées; la partie antérieure sculptée d'avant en arrière par des lignes régulières saillantes et granuleuses; la postérieure par d'autres lignes moins en relief, obliquant d'arrière en avant, courbées au sommet et à la base, où elles se continuent avec celles du sillon. Auricules postérieures ascendantes à la marge et tronquées. Appendice de l'intérieure des valves arqué, aplati, étroit et prolongé jusqu'aux deux tiers de leur face intérieure.

"Tube cornico-cylindrique, un peu arqué, recouvert d'un épiderme, brun, rugueux, très-ouvert et à bords minces en avant, solide en arrière, échancré en dessus plus fortement qu'en dessous, à côtés prolongés en pointe obtuse et renforcés en dedans par un angle aigu correspondant aux échancrures des palettes. Longueur 26 millim.; largeur: en avant 6 millim. $\frac{1}{4}$; en arrière 2 millim. $\frac{1}{2}$."

T. dilatata, Stimpson.

T. dilatata, Stimpson, Bost. Proc. iv. 1851, p. 113. Stimpson, Check List, No. 250. Stimpson, Shells of New England, p. 26. Adams, Genera ii. p. 333. Kurtz, Cat. p. 3. Tufts, Proc. Essex Inst. i. p. 26.

Hab.—United States from the coast of Massachusetts to South Carolina.

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Description.—"Valves white, polished; length and breadth equal; anterior area with fine, concentric, somewhat divergent striae, varying in number in different specimens, and more crowded below; the slightly oblique lines on the succeeding narrow area are very minute but sharp; the next, fang-shaped area is ornamented with distant, narrow, elevated, subimbricated, concentric lines, more conspicuous on the anterior than on the posterior half of the area; the remaining portion of the body and the auricle are smooth and glossy. The auricle is not separated from the body by any sharp angle on the posterior ventral outline, but by a gently waved sinus. A depressed line runs from the beak around to the tip of the auricle, which does not tower above the callosities of the hinge. The subumbonal blade is thin, tapering, and extends to about half the distance from the beak to the ventral edge.

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"The pallets are of an angular ovate form, truncated posteriorly, where also, on the external surface there is a small depressed area. The style of insertion is sharp, and extends in the form of a ridge for some distance on both sides after its juncture with the pallet. The tubes are very thin, strongly concamerated posteriorly in an imbricated manner. This species differs from *T. megotara*, Hanley, which it greatly resembles, in the smaller altitude of the valves, the greater breadth of the auricle, which is also placed much lower, and in its concamerated tubes.

"Length of valves nearly one-half of an inch.

"For many living specimens of this species, I am indebted to Mr. S. Tufts, of Lynn (Mass.), who obtained them from a pine buoy used to indicate the position of the lobster pots of fishermen. Thus there can be no doubt of their being indigenous. They commit yearly great ravages upon the shipping of Lynn and Marblehead."—*Stimpson's description*.

T. divaricata, Deshayes.

T. divaricata, Deshayes, MSS. Fischer, Journ. Conchyl., 2d ser. i. p. 137, t. 7, f. 7, 8, 9.

T. Norvagia, var. *divaricata*, Jeffreys, Ann. & Mag. Nat. Hist. 3d ser. vi. p. 121.

Habitat.—Sicily.

Description.—Shell globular, convex, heavy, full as wide as its length. Anterior auricle very large and long, being two-thirds the length of the fang; its anterior margin thick, appearing almost ribbed, somewhat concave but nearly straight, inclining outwards; basal margin very convex, joining the fang by an acute angle. The fang is but slightly raised above the anterior area and is itself somewhat lower, or nearly on a level with the margin of the posterior auricle; the whole dorsal edge of the shell is slightly convex. Lateral margins of the fang inclining obliquely, with the ventral termination truncate. Posterior auricle very small, (almost none,) much longer than wide, but its basal margin does not extend nearly so far down as that of the anterior area. The latter is covered with concentric striæ, which, at its junction with the body, are recurved obliquely downwards and posteriorward. The space between the centre and posterior lateral margin of the fang, appears to be occupied by the same double, narrow, closely striated radiating area, that is found on the anterior side in *T. megotara*, &c. Posterior auricle somewhat striated. Internal dorsal margin very wide and massive. Apophysis wide, recurved backwards in front.

Pallets truncate, resembling those of *T. Norvagia*, their blades very short.

Mr. Jeffreys considers this a variety of *T. Norvagia*, but, if Fischer's figures can be depended on, it is certainly very distinct from that species. It may be proper to add, that my description is made up from that of Fischer, and his illustrations.

T. malleolus, Turton.

T. malleolus, Turton, Conch. Dithyra, p. 255, t. 2. f. 19. Adams, Genera, ii. p. 333. Brown, Conch. Gt. Brit. p. 116, t. 50, f. 16. Fleming, Brit. Anim. p. 454. Gray, Phil. Mag. 1827, p. 410. Gray, Ann. & Mag. Nat. Hist. 2 ser. viii. p. 386. Hanley, Desc. Cat. p. 4, t. 11, f. 23. Hanley, Brit. Moll. i. p. 84, t. 1, f. 12—14. Jeffreys, Ann. & Mag. Nat. Hist. 3d ser. vi. p. 123. Sowerby, Ill. Brit. Shells, t. 1, f. 5. Thompson, Fauna of Ireland, Ann. & Mag. Nat. Hist. xx. p. 174. Thorpe, Brit. Mar. Conch. p. 28.

Hab.—England, Ireland, (*introduced*.) Native habitat Sumatra.

Description.—Valve, with the body very convex, narrow, much longer than 1862.]

broad, the anterior area moderate, the posterior narrow and extending above the beaks.

Anterior auricle with its dorsal margin declining concavely from the beak to a lateral angle, whence its basal margin extends rather convexly and obliquely downwards to its junction at an angle with the body, the point of junction being horizontal with, or slightly below that of the posterior auricle, and at about two-fifths the length of the shell from its apex.

The lateral margins of the fang are, anteriorly very slightly concave, posteriorly convex, and the ventral termination is infolded, forming a strong internal tubercle.

Posterior auricle quite narrow, being about three times as long as its width, reaching in typical specimens slightly above the beaks; its posterior margin is very oblique and curved, following the direction of the fang. Beaks elevated, not wide.

Internally, the shell is quite concave, with the auricles but little reflected, the posterior one marked by a shell-like ridge extending over the body. Apophysis oblique, slanting posteriorly, strongly clavate at its termination. Dorsal margin somewhat lamellar, becoming prominently elevated at the beaks, where it is crowned by a tubercle.

Color white, glossy; the anterior area elegantly concentrically sculptured, the anterior side of the body ornamented with the usual narrow radiating and decussately striated area, posterior to which the surface gradually becomes smooth.

The tube is semi-concamerated, and very fragile.

The pallets are widely different from those of any other species, the blade being very transverse, much broader than long and widest at the apex, which is a horizontal sinuous line: both lateral margins are generally angularly convex, rapidly diminishing to the short compressed stalk. The stalk, instead of continuing in the same plane as the broad side of the blade, is deflected from it at an obtuse angle.

T. megotara, Hanley.

T. megotara, Hanley, Brit. Conch. i. p. 77, t. 1, f. 6, and t. 18, f. 1, 2.

Jeffreys, Ann. & Mag. Nat. Hist. 3d ser. vi. p. 121. Sowerby, Illust.

Brit. Shells, t. 1, f. 3.

nana, (part.) Fischer, Journ. Conchyl. 2 ser. i. p. 136. Gray Ann. & Mag.

Nat. Hist. 2 ser. viii. p. 386.

oceanii, Sellius, Hist. Nat. Tered.

Bruma dell'oceano, Vallisnieri, Op. Phys. Med.

Hab.—England.

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Description.—Valves about as wide across the auricles as their length, the body rapidly attenuated to the base. The anterior auricle is moderate and subtriangular; the posterior is dilated, very large, and rising above the beak, while its basal margin extends *below* the line of that of the anterior area.

The anterior area nearly approximates in form to that of *T. Norvegica* and joins the body below, at right angles. The posterior auricle exhibits a marked difference from that of the last-named species; its dorsal margin is so very concave in form as ordinarily to exhibit an approach to three-fourths of a circle, the highest posterior point of which is curved forwards somewhat, so that the dorsal apex of the auricle points anteriorly and extends above the beak. From this highest point the margin posteriorward is obliquely declining and moderately convex in outline to the extreme posterior extension, (which is considerably below the middle of the auricle) whence it sweeps around very convexly, joining the fang or body considerably below the middle of the valve, and below the line of the base of the anterior area, by a somewhat rounded angle. The anterior lateral margin of the body is directed posteriorly, and is

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slightly flexuous or nearly straight; the posterior lateral margin is more convex, and eventually sweeps rapidly to the anterior side, its junction with which forms an acute or narrow ventral termination. The beaks are very narrow, tuberculated, and elevated.

The surface externally and internally, like the other species, is ivory white and somewhat polished. The anterior area is concentrically sculptured, becoming more crowded towards its base; it is separated by a slightly impressed line from the body. The body is ornamented by a radiating narrow area, increasing towards the base, both sides defined by a furrow. This area is subdivided into two, and is closely transversely striated, and marked less frequently by minute raised ridges, directed obliquely downwards to the centre from each outer margin. The surface of the fang and auricle posterior to the radiating area, is smooth or sparingly striate. The auricle is not separated from the body by any marked line, but its commencement is marked by the transition from a convex to a concave surface, caused by the great outward reflexion of the auricle.

Internally, the beak is small but prominent, bearing a narrow oblique rib on its surface, and turned posteriorly. The apophysis hugs rather closely to the body, and is thin, blade-shaped and acuminate to the end. The ventral tubercle is well formed and conspicuous but does not exhibit much evidence of arising from an internal rib. The auricle is not internally defined, save by the greater thinness and translucency of its substance.

The pallets are small, the blades are somewhat heart-shaped at the apex, rounded and curved outwards to an extreme point near their base on either side. These points are not opposite, but one is situated higher on the blade than the other; from these the margins concavely contract into the stalks, which become narrower towards their termination, ending in a point.

Tube solid, not concamerated, twelve to eighteen inches long. Diameter of valves about half an inch. Mr. Hanley described this species in the British Mollusca, supposing it to be identical with Turton's *T. nana*, whose name and description he suppressed on the ground that they were founded on young and imperfect shells. It has since been ascertained that this species is distinct from *T. nana*.

Messrs. Fischer and Jeffreys both consider *T. dilatata* of Stimpson, a synonym of this species, but the concamerated tube and differently formed pallets are prominent distinctive characters.

The blade of the pallet in *dilatata* dilates convexly from a very fragile stalk into a broadly oval form, truncate at the end, while in *T. megotara* the dilation is *concave* to a point on each side, from which the margins are narrowed and rounded to a bilobed truncated end. The pallets of *dilatata* are more nearly allied to those of *Norvagia* than to *megotara*.

T. nana, Turton.

T. nana, Turton, Conch. Dithyra, p. 16, t. 2, f. 67. Adams, Genera, ii. p. 333. Brown Conch. Gt. Brit. p. 116, t. 50, f. 14, 15. Catlow, Conch. Nomenc. p. 3. Fleming, Brit. Anim. p. 455. Gray, Phil. Mag. 1827, p. 410. Hanley, Desc. Cat. p. 4, t. 11, f. 22. Jeffreys, Ann. & Mag. Nat. Hist. 3d ser. vi. p. 122. Thorpe, Brit. Mar. Conch. p. 29.

T. nana, (part.) Fischer, Journ. Conchyl. 2d ser. i. p. 136. Gray, Ann. & Mag. Nat. Hist. 2d ser. viii. p. 386.

T. mavalis, Möller, Moll. Grøn.

T. denticulata, Gray, Ann. & Mag. Nat. Hist. 2d ser. viii. p. 386. Adams, Genera, ii. p. 333. Fischer, Journ. Conchyl. 2d ser. i. p. 135.

Pholas Teredo, Müller, Prodr. Tool. Dan, p. 251. Fabricius, Faun. Grøn. p. 427.

Hab.—England. "Floating wood. Occurs with *T. megotara* and *subericola*, but by no means so numerous as either of them." Jeffreys, Northern Ocean. Greenland.

1862.]

Description.—Having no good figure of *T. nana*, nor specimens to refer to, I can only give the distinctive characters from *T. megotara* as pointed out by Mr. Jeffreys, and also Fischer's description of *T. denticulata*.

"Coquille subsphérique, mince, très-ouverte antérieurement et postérieurement, inégalement divisée en deux portions par un zonule submédiane; bord antérieur étroit, formant un angle droit profond, oreillette antérieure aiguë postérieure lisse, plus large, réfléchie. Palettes ovalves, allongées, minces; pédicule grêle, court, aigu."—*Fischer*.

"It differs from *megotara* in the valves being more compressed and solid, in the anterior auricle being much smaller, and having a more obtuse angle and fewer striæ, in the posterior auricle being larger and higher, and especially in the very strong and prominent tubercle or false tooth. The tube of *T. nana* appears to be destitute of calcareous lining, except towards the entrances, while *T. megotara* forms a solid tunnel; and the lunule of the pallets is more incised in *T. nana*. Adult specimens measure 21 inches in length. The Turtonian types decidedly belong to this species and not to *megotara*."—*Jeffreys*.

Turton's miserable description from imperfect and immature specimens, is—

"Shell with the valves rounded, and *without auricles behind*, a strong conic tooth on the margin above the teeth."

T. navalis, Linn.

T. navalis, Linnæus, Syst. Nat. ed. 10, p. 651; ed. 12, p. 1267. Adams, Genera, ii. p. 333. Blainville, Dict. Sc. Nat. lii. p. 267. Bosc, Conch. ii. p. 202, t. 5, f. 4-7. Catlow, Conch. Nomenc. p. 3. Chenu, Encyc. Hist. Nat. Moll. p. 233, f. 245-7. Cuvier, Regne Anim. i. ed.; ii. p. 494. id. ed. 2, iii. p. 160; id. ed. Griffith, xii. t. 8, f. 2; id. ed. Audouin. t. 114, f. 2. Delle Chiaje, Mem. iv. p. 23, 32, t. 54, f. 2, 8. Deshayes. Traité Elem. i. pt. 2, p. 59, t. 3, f. 1-9. D'Orbigny, Moll.; Sagra's Cuba, p. 211. Eichwald, Fauna Caspio Caucasica, p. 23. Ferrussac, Encyc. Meth. p. 1003. Fischer, Journ. Conch. 2d ser. i. p. 134. Forbes & Hanley, Brit. Moll. i. p. 74, t. 1, f. 7, 8, t. 18, f. 3, 4. Georgi. Beschreib. des Russ. Reichs. iii. p. 2216. Gerville, Cat. Coq. Manche. p. 55, Gmelin, Syst. Nat. p. 3747. Gould, Invert. Mass. p. 26. Guérin, Iconog. du Reg. Anim. Moll. t. 33, f. 2. Hanley, Shells of Linn. p. 450. Heinrich, Medicinische Zeitung Russlands, 1845, p. 372. Jay, Desc. Cat. 4th edit. p. 9. Karsten, Mus. Leskeanum, t. 1, p. 308. Lamarck, Anim. sans. Vert. v. p. 440. Middendorff, Mal. Rossica, iii. p. 79. Pallas, Reise. Siid. Russ. p. 418. Pallas, Tabl. Phys. de la Tauride, p. 40. Payraudeau, Cog. du Corse, p. 26. Pennant Brit. Zoel. 1 ed. iv. p. 147. Philippi, Moll. Sicil. i. p. 2; ii. p. 3. Poli, Test. Utr. Sicil. pt. 2, t. 57, f. 45, 46. Potiez et Michaud, Galerie des Moll. ii. p. 273. Scacchi, Cat. Coq. Reg. Neap. p. 8. Sowerby, Ill. Brit. Shells, t. 1, f. 1. Wheatley, Cat. No. 30.

T. marina, Sellius, Hist. Nat. Tereb. t. 2, f. 2, 3, 6. Jeffreys, Ann. & Mag. Nat. Hist. 3d ser. vi. p. 124.

T. Batava, Spengler, Skrivt. Nat. ii. pt. 1, p. 103, t. 2, f. C. Gray, Ann. & Mag. Nat. Hist. 2d ser. viii. p. 386.

T. vulgaris, Lamarck, Syst. des Anim. s. Vert. 1801, p. 128.

Dentalium navis, Linnæus, Faun. Suec. No. 1329. p. 380. Belkmeer, Naturkundige. Zee, Worm. t. 2, f. 7, 8, 9. Frisch, Mus. Hoffmannianum, t. 1, t. 2, f. 9, t. 3, f. 19, 20, t. 4, f. 2, 5, 6. Massuet, Recherches sur les Vers. t. 1, f. 1, 2. Monath, Dissert. sur le Taret de Hollande, t. 1, t. 2, f. 9, t. 3, f. 19, 20, t. 4, f. 2, 5, 6. Rousset, p. 15, 16, 17, f. 1, 2, 3, 4, 10. Vallisnieri, Nat. ii. t. 4.

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Hab.—England; Holland; Senegal; United States; North Sea; Mediterranean Sea.

Coll. Acad. Nat. Sc. Helgate, New York, from a British frigate sunk during the revolutionary war.

Description. Valves about equal in length and breadth, much resembling in general form those of *T. Norvagia*, but with the posterior auricle expanded somewhat laterally, and its base extending lower than that of the anterior area. The anterior area moderate, not generally so large in proportion to the valve as that of *Norvagia*, and having a more convex basal margin; it inclines somewhat obliquely downwards to the fang, its junction being considerably higher up than that of the posterior auricle. Anterior lateral margin of the fang nearly straight; posterior lateral margin much shorter than the other, on account of the lower extension of its auricle, very oblique. Fang acuminate rapidly towards the base. Posterior auricle not ascending, but produced laterally, its dorsal edge mostly somewhat concave, lateral margin nearly straight, a little oblique, rounded at each end. Basal margin slightly declining towards the fang, shorter than the dorsal edge on account of the expansion of the fang laterally.

The internal ventral tubercle and the dorsal rim do not differ from those of *T. Norvagia*. The apophysis is broad but thin, not thickened at the end, and the same breadth throughout; it is twisted so that one sharp edge, instead of the flat of the blade, is turned towards the interior surface of the fang. The posterior auricle is defined by a close, projecting rim.

Externally, the anterior area is closely striated concentrically, and its posterior limit is defined by an impressed line; succeeding to this is a radiating, narrow area, the closely decussated striae of which, are sometimes quite prominent; posteriorly the surface is slightly striate concentrically, becoming smooth. The auricle is defined by a sudden depression in the level of the surface of the fang.

The pallet is convex on one side and plane on the other; the stalk, which is about as long as the blade, is moderately thick, and flexuous; it is not continued as a rib beyond the commencement of the blade, which differs from that of *T. Norvagia* by being more convex below, (the entire base being semi-circular) with the sides concave, and the end two-pointed, caused by a decided concavity of the centre of the margin. Tube not concamerated, long, flexuous, solid, polished, gradually narrowing.

Valves and pallets each one-fourth of an inch, and the tube eight inches in length.

This species is the *T. marina* of Sellius, who published, in 1733, an excellent description and figures. Unfortunately his name cannot be adopted, because pre-Linnaean, and this is the more to be regretted since the description in the *Syst. Nat.** will apply to any species in the genus, and the species is only limited by the reference to the figures of Sellius.

Mr. Hanley, as one important result of his laborious examination of the types in the collection of the great Swedish naturalist, demonstrated its identity with the species of Sellius.

The *navalis* of Brit. authors prior to Forbes and Hanley, is *T. Norvagia*, Spengler. Many of the authorities quoted above must be admitted with doubt, —several of their descriptions are equally applicable to any species, and occasionally the figures are no more characteristic.†

It is doubtful whether the *navalis* of Sicily, Corsica and the Black Sea is

* "*T. Testa tenuissima cylindrica lævii.*"—*Linn.*

† The synonymy and specific description in Deshayes' *Expl. Scientifique de l'Algérie*, Mollusques, must be taken with great caution. The first is an indiscriminate grouping of references to all the species described by different authors, as the *T. navalis* of Linn., and the last is sufficiently general to cover them all!

the same as that of Linnæus; a close examination will perhaps prove them to be distinct.

T. Norvagica, Spengler.

- T. Norvagica*, Spengler, Skrivt. Nat. ii. pt. 1, p. 102, t. 2, f. 4—6, 1792.
 Fischer, Journ. Conch. 2d ser. i. p. 138. Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 386. Forbes and Hanley, Brit. Mollusca, i. p. 67, t. 1, f. 1—5. Jeffreys, Ann. and Mag. Nat. Hist. 3d ser. vi. p. 121. Schumacher, Essai d'un Nov. Syst. p. 94.
T. Norvegica, Adams, Genera, ii. p. 333, t. 90, f. 6. a. b. c. d. Chenu, Man. Conchyl. tome 2, f. 60, 61. Jay, Catalogue, 4th edit. p. 9. Sowerby, Illust. Brit. Shells, t. 1, f. 2. Thompson, Ann. and Mag. N. H. xx. p. 157. Woodward, Manual, t. 23, f. 26—27.
T. Bruguerii, Delle Chiaje, Mem. iv. p. 28, 32, t. 54, f. 9—12. Philippi, Moll. Sicil. i. p. 2; and ii. p. 3.
T. Deshayesi, Quatrefages, Ann. des Sc. Nat. 3 ser. xi. p. 26.
T. fatalis, Quatrefages, Ann. des Sc. Nat. 3 ser. xi. p. 23, t. 1, f. 1.
T. nigra, Blainville, Dict. Sc. Nat. lii. p. 267.
T. Senegalensis, Laurent, Journ. Conchyl. i.
T. navalis, Brown, Conch. Brit. p. 116, t. 50, f. 1—7. Burrows, Conch. t. 22, f. 4. Crouch, Introd. Lamarck's Conch. t. 2, f. 10. DeKay, Moll. N. Y. p. 249, t. 34, f. 325, a. b. c. Donovan, Brit. Shells, v. t. 145. Encyc. Meth. t. 167, f. 1—5. Fleming, Brit. Anim. p. 454. Gould, Invert. Mass. p. 26? Gray, Phil. Mag. 1827, p. 410. Hanley Desc. Cat. p. 3. Humphrey, Conch. t. 10, f. 2, 3. Lamarck, Anim. sans. Vert. ed. 2, vi. p. 38 (not Synon's.) Maton and Rackett, Linn. Trans. viii. p. 249. Mawe, Conch. t. 35. Montagu, Test. Brit. p. 527; and Supp. p. 7. Pennant, Brit. Zool. iv. p. 147. Pultney, Dorset. Cat. p. 53, t. 18, f. 21. Reeve, Conch. Syst. t. 21. Sowerby, Genera; Sowerby, Conch. Man. f. 48. Thorpe, Brit. Mar. Conch. p. 28. Turton, Conch. Dict. p. 183. Turton, Conch. Dithyra, p. 14, t. 2, f. 1, 2, 3. Wood, Index Test. t. 38, f. 2.
T. navium, Sellius, Hist. Nat. Tered. t. 1, f. 1, 5.
T. Mediterraneus, Catlow, Conch. Nomencl. p. 3.
Septaria Mediterranea, Matheron, Ann. des Sc. du Midi, France, i. p. 77, ii. p. 312, t. 1. Deshayes, Traite Elem. i. pt. 2, p. 46, t. 2, f. 9 and 10. Cuvier, Reg. Anim. (ed. Audouin) t. 114, f. 3.
Serpula Teredo, De Costa, Brit. Shells, p. 21.
Bruma delle navi, Vallisnieri, Op. Phys. Med.
Fistulana corniformis, Lamarck, Anim. sans. Vert. v. p. 435; 2d edit. vi. p. 31. Blainville, Dict. des Sc. Nat. xvii. p. 85. Blainville, Man. Mal. t. 81, f. 4. Chenu, Man. de Conchyl. ii. f. 63.
Guetera corniformis, Gray, Ann. and Mag. N. Hist. 2 ser. viii. p. 386.
Uperotis corniformis, Adams, Genera, ii. p. 333.
Teredo corniformis, Catlow, Conch. Nomencl. p. 3. Deshayes, Note in Lam. Anim. sans. Vert. 2 edit. vi. p. 29. Gray, Phil. Mag. 1827, p. 410.
Teredo utriculus, Gmelin, Syst. Nat. p. 3748. Bosc, Conch. ii. p. 202. Dillwyn, Desc. Cat. p. 1089. Kammerer, Cab. Rudolst, p. 7, t. 1? Wood, Index Test. t. 38, f. 3.

Hab.—Channel Isles and Devonshire, England; coast of France; Senegal? United States? Mediterranean Sea.

Coll. Acad. Nat. Sciences.

Description.—Valves of moderate size and solidity, longer than broad. The anterior auricle subtriangular, about equalling the posterior in size, and the basal margins of the two being nearly on a horizontal line. The body or fang-shaped portion is rather more than double the length of the auricles, and is about half as wide as its length. The posterior auricle is not elevated nor ex-

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panded, its outline is semi-orbicular, flattened somewhat on the upper margin, but quite convex laterally, and moderately so basally, where its junction with the body is not angulated or but slightly so.

The dorsal edge of the anterior area descends concavely to an acute point, whence the basal edge, sweeping in a quarter circle and thence continuing horizontally, is brought to join the body or fang almost at right angles. The anterior side of the body from this junction is almost straight to the base, its direction being slightly inclined to the posterior side of the valve. The posterior lateral edge of the body from its junction with the auricle is continued towards the base, first slightly, but at length becoming decidedly convex in outline, until its somewhat angular junction by a rounded basal margin, with the anterior side. The surface of the body towards the beaks becomes convex and elevated, sloping off towards each side and also towards its dorsal margin, which is mostly higher than either auricle, and convex in outline. The dorsal edge of the posterior auricle is generally somewhat concave in outline, descending slightly from the beaks in typical specimens, although occasionally it is parallel with or even rising slightly above them; its posterior lateral termination is marked by a slight reflexion upwards, from which the marginal outline of the lateral and basal sides, as before stated, is convex to its junction with the body.

Viewed internally, the whole dorsal margin of the valve is marked by a raised or thickened border; the beaks are rather large and overhanging, culminating in an irregular tubercle in the centre, from beneath which springs a rather broad curved blade, which terminates in a rapidly enlarging, rounded or irregular clavate end. The inner surface of the fang or body is also marked by an elevated rib, which, not particularly prominent at first, becomes more distinct as it approaches the base, and is there arrested and turned upon itself apparently by the infolding of the exterior surface, forming a rounded tubercle. The division of the posterior auricle from the fang is internally defined by an oblique curved carina, the lower edge of which, near the beaks, slightly projects over the inner disc, but it does not, as in some of the other species, form a continuous ledge from the beaks to the margin. The internal surface of the fang is hollowed in the centre, rising towards either auricle, which becomes convex in the middle and laterally reflected outwards. The surface is pure white and polished.

The external markings of the valve are very beautiful,—the anterior area is ornamented by about sixty close and sharp concentric striæ diverging from the dorsal margin. A narrow radiating area enlarging from the beaks towards the base, occupies the anterior portion of the body and is closely covered with a series of beautiful minute grooves, which define the boundary-line of the anterior area by their junction almost at right angles with its striæ, these fine grooves, when viewed with a microscope, are found to be decussated by still finer lines. Posteriorly, to this area, the grooves diverge into rather distant slight concentric arches gradually vanishing towards the posterior auricle, the commencement of which is defined by a line, occasionally obsolete. The auricle is generally smooth, but occasionally with confluent raised granules or points. The whole surface is white and polished when devoid, as it usually is, of its thin olivaceous epidermis.

The pallets are somewhat spoon-shaped in outline with a truncate apex. One side is convex and plain, whilst the other is concave, with a raised mid-rib, which, becoming more prominent towards the base, merges into the stalk, which is slender, cylindrical, or flexuous, and about as long as the blade.

The tube is not much contorted, but generally slightly flexuous, narrow, tapering, polished externally, solid in texture and rather easily detached from its burrow. It is semi-concamerated at its lower end, divided by ten or twelve crowded, thin, orbicular partitions, which, however, leave a large oval orifice in the centre.

1862.]

Dimensions.—Length of valves half an inch; breadth somewhat less. Length of tube about one foot; but individuals have occurred in which the tube is two and one-half feet long and the valves three-fourths of an inch.

Mr. Jeffreys considers the *T. corniformis* of Lamarck to be the tube of this species, which is very probable, and I have therefore placed that species among the synonyms of *Norvagia*.

The present shell is the *T. navalis* of all British authors prior to Forbes and Hanley's *Mollusca*, the confusion of the species originating in the miserable description of the *Syst. Naturæ*, which will apply equally well to any species of the genus, and continued, probably, from the difficulty of procuring extensive suites of specimens, and from the uninviting nature of their study.

The figures of DeKay are copied from Turton, and therefore represent this shell and not the true *T. navalis*.

The illustrations in Donovan and Pultney will suit equally well for this or either of the other British *Teredæ*.

T. nigra, Blainville, is considered by Messrs. Fischer and Jeffreys to be a synonym of *Norvagia*, and not having seen specimens, I have followed them in including it here, but as it appears to me that the original description does not exactly suit *Norvagia*, I reproduce it here.

“Coquille assez grande, de quatre à cinq lignes de haut sur autant de long, épaisse, solide, entièrement couverte d'un épiderme noir; côté postérieur ou tranchant fortement anguleux et strié au moins de soixant stries très-serrées, surtout sur la partie verticale; pallets ovales, allongées, non-tronquées.

Cette grande espèce de taret, dont je possède un individu envoyé par Mlle. Warn à M. DeFrance, a été trouvée sur les côtes d'Angleterre, dans la carcasse d'un navire venant de l'Inde et échoué depuis long-temps à quelque distance, du rivage. Elle est parfaitement distinct par sa taille, sa couleur, et par le nombre considerable de ses stries.

T. pedicellata, Quatrefages.

T. pedicellatus, Quatrefages, *Ann. des Sc. Phys.* 3d ser. xi. p. 26, t. 1, f. 2. Adams, *Genera*, ii. p. 333.

T. pedicellata, Fischer, *Journ. Conchyl.* 2d ser. i. p. 139. Jeffreys, *Ann. and Mag. Nat. Hist.* 3d ser. vi. p. 123.

Hab.—Islands in the British channel and Northern Coast of Spain and Algiers.

Description.—“Coquille subsphérique à peu près aussi longue que large; angle antérieur presque droit (90°), tombant fort en arrière. Stries très-fines et très nombreuses. Palmules étroites, allongées, portées à l'extrémité d'une sorte de manche d'apparence cartilagineuse. Le pédicule est toujours blanc, tandis que les palettes s'ent colorées en brun foncé. Taille inférieure de moitié environ à celle du *Ter. Norvagia*.”—*Fischer*.

“Although the valves in adult specimens bear a close resemblance to those of the following species, (*T. marina*) the pallets are unmistakably different; and in the young the striae on the anterior auricle of the valves are much fewer, and consequently more remote than in that species. Where both species occur together, the present occupies the outer layers of the wood, while the other penetrates into its recesses. Quatrefages discovered this species at Guibuscoa, on the North coast of Spain; and I noticed it in some wood which M. Deshayes had taken on the Algerine coast. The tube is a beautiful object, being jointed in an imbricated manner, like the stalk of an *equisetum*.”—*Jeffreys*.

T. Senegalensis, Blainville.

T. Senegalensis, Blainville, *Dict. des Sc. Nat.* lii. p. 267. Jeffreys, *Ann. and Mag. Nat. Hist.* 3d ser. vi. p. 126. Adams, *Genera*, ii. p. 333, [Sept.

Taret du Sénégal, Adanson, Hist. Nat. du Senegal, p. 264. t. 19. Adanson,

Mem. de l'Acad. des Sc. 1759, p. 278, t. 9, f. 9, 10.

Hab.—In Mangrove roots. Coast of Senegal.

Description.—"Coquille un peu plus grosse, plus évidemment rhomboïdale, ou à quatre côtés obliques. Le bord tranchant strié de vingt-cinq stries denticulées. Pallets en spatule tronquée et non bicornée. Cette espèce, qui est indubitablement distincte du taret commun, quoiqu'il soit assez difficile de la caractériser complètement, à cause du peu de détails dans lesquels Adanson est entré à son sujet, est fort commune dans les racines des mangliers qui bordent les fleuves Niger et de Gambie. Elle les perce verticalement, quelquefois à deux ou trois pieds; mais ordinairement à six pouces au dessus de terre."—*Blainville*.

T. truncata, Quatrefages.

T. truncata, Quatrefages, Ann. des Sc. Nat., 3d ser., xi. p. 27. Adams, Genera, ii. p. 333. Fischer, Journ. Conch., 2d ser., i. p. 133. Jeffreys, Ann. and Mag. Nat. Hist., 3d ser., vi. p. 126.

Hab.—Amboina, Quoy et Gaimard.

Description.—"Coquille fragile, presque sphérique, fortement échancrée et anguleuse à son bord antérieur; l'angle antérieur est de 90° environ, son sommet se trouve placé assez en arrière, et ses bords paraissent plus rectilignes que dans la plupart des autres espèces. Stries de l'oreillette antérieure assez irrégulières, si ce n'est vers les bords; palettes pédiculées, tricuspidées, obliquement taillées en biseau de dehors en dedans."—*Fischer*.

Quatrefages' Description is "testâ fragili, quasi sphaericâ, alte emarginatâ; emarginatione 90 gradibus hiant; palmulis pedicellatis, in obliquum truncatus, tridenticulatis."

Subgenus CALOBATES, Gould.

CALOBATES, Gould, Proc. Bost. Soc. Nat. Hist., viii. p. 280, Feb., 1862. Gould, Otia Conchologica, p. 241, 1862.

Description.—"Pallets stilt-shaped, bony. Type *T. thoracites*, Gould."

I owe to the kindness of the author, an opportunity to examine specimens of the valves of this interesting shell, and also a sketch of the pallets. The latter are indeed very remarkable, and indicate very clearly a subgeneric, if not generic distinction, from *TAREDO*. A more particular description of them is contained in that of the species.

T. thoracites, Gould.

T. thoracites, Gould, Bost. Proc., vi. p. 15. Gould, Otia Conchologica, p. 222, 241.

Hab.—Burmah.

Description.—"Shell large, solid, length and breadth about equal; valves trifoliate, the anterior area or leaf being very large proportionally, or about equal to the fang-like body, excepting that it is truncated anteriorly, where it is smooth, shining and callous. This anterior area is obtusely lance-pointed and sculptured with concentric striæ parallel to its basal edge, and with a few delicate cracks or rugæ radiating from the beaks; the fang-like body is large and broad, obtuse at point, and armed within by a firm rib, terminating in a rounded ivory knob; a strong flattened ridge traverses its posterior extremity, running from the junction of the posterior wing above to the point of the fang; anterior to this the fang is grooved parallel to the anterior edge; while posterior to it they take the direction of the inferior edge of the wing, and become gradually more and more recurved towards the point, and are continued on to the ridge. The posterior dorsal wing is very small and lunate, not rising above the beaks, gently arched, scarcely projecting beyond the posterior margin of the fang, its lower margin would correspond with the lower 1862.]

margin of the anterior area if continued; the superior margin is rough and bony, forming a broad area defined by a sharp crested ridge, and emarginated at the junction of the wing. Hinge tubercles large, with a hook-shaped process from each, by which the valves are interlocked; the wing is formed by a sharp shell-like ridge, and is smooth and slightly excavated. The cavity of the beak is filled with a spongy calcareous matter, from which issues the delicate and flattened subumbonal process which presents its flat side to the valve, and at about one-third its length forms a decided elbow backwards.

Length from before backwards $\frac{3}{4}$ inch; from above downwards a little less.

Pallettes very large and long, stilt-shaped; the style long and subulate, slightly flexuous, bony, surrounded by a broad dilatation or step, concave on one side and convex on the other; its upper surface deeply excavated, on this is placed the blade, which is three-fourths as long as the style, thin, linear, obliquely truncated at tips, about one-third the width of the step.

Length of style 7-10ths; of blade 4-10ths inch.

Brought by Rev. F. Mason and Rev. J. Benjamin from Tavoy.

In size and solidity this exceeds all the species yet described, it is chiefly distinguished by the great size of the anterior triangular portion when compared with the posterior alar portion or auricle.

The form of the pallettes also is entirely different from any yet described; nor do I find any mention elsewhere of the spongy calcareous growth in the umbonal cavity."—Gould.

Genus UPEROTIS, Guettard.

UPEROTIS, Guettard, Memoirs, ii. p. 128. Adams, Genera, ii. p. 333.

Guetera, Gray, Syn. Brit. Mus., 1842. Gray, Zool. Proc., p. 188, 1847. Gray, Ann. and Mag. Nat. Hist., 2d ser., viii. p. 381.

Serpula, (part.) Mawe, Conch., p. 194.

Fistulana, (part.) Blainville, Dict. Sc. Nat., xvii. p. 82. Bosc. Hist. Coq., ii. p. 203. Griffith, Cuvier Regne Anim., xii. p. 124. Guerin, Iconog. Reg. Anim. Moll., t. 33. Hanley, Desc. Cat., p. 3. Lamarck, Anim. sans. Vert., v. p. 432; id. 2d edit., vi. p. 25. Potiez et Michaud, Galerie des Moll., ii. p. 272. Schröter, Einleit., ii. Walch, Naturf., x. p. 38.

Teredo, (part.) Catlow, Conch. Nomenc., p. 2. Cuvier, Regne Anim., edit. Audouin Moll., p. 252. Deshayes, Traité Elem., pt. ii. p. 47. Deshayes, Note in 2d edit., Lamarck, Anim. sans. Vert., vi. p. 39. Dillwyn, Desc. Cat., p. 1087. Gray, Phil. Mag., 1827, p. 409. Jay, Cat., 4th edit., p. 9. Wood, Index Test., t. 38.

Dr. Gray includes in his genus *Guetera*, besides the *U. clava*, two other specimens, which he names:—

G. lagenula? this = *Cucurbitula cymbia*, Spengler (GASTROCHÆNIDÆ).

G. corniformis, this = tube of *Teredo Norvægica*, Spengler.

U. clava, Gmelin, sp.

Teredo clava, Gmelin, Syst. Nat., p. 3748. Dillwyn, Desc. Cat., p. 1090. Gray, Phil. Mag., 1827, p. 410. Guettard, Mém., iii. t. 7, f. 6—9. Wood, Index Test., t. 38, f. 4.

Guetera clava, Gray, Ann. Mag. Nat. Hist., 2d ser., viii. p. 386.

U. clava, Adams, Genera, ii. p. 333.

Fistulana gregata, Lamarck, Anim. sans. Vert., v. p. 435; ditto, 2d edit., vi. p. 31. Bosc, Hist. Coq., ii. p. 204. Encyc. Meth., t. 167, f. 6—14. Griffith, Cuv. Reg. Anim., xii. t. 8, f. 3. Guerin, Iconog. Reg. Anim. Moll., t. 33, f. 3. Hanley, Desc. Cat., p. 3. Potiez et Michaud, Galerie des Moll., ii. p. 272. Schröter, Einleit., ii. p. 574, t. 6, f. 20. Walch, Naturforsch., x. p. 38, t. 1, f. 9, 10.

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Teredo gregata, Deshayes, Note in 2d edit. Lam. Ann. sans. Vert., vi. p. 39.

Fistulana gregaria, Blainville, Dict. Sc. Nat., p. 83.

Serpula retorta, Mawe, Conch., t. 34, f. 5.

Teredo nucivorus, Spengler, Skrivt. Nat., ii. pt. 1, p. 105, t. 2, f. d. Catlow,

Conch. Nomenc., p. 3. Cuvier, Regne Anim., ed. Audouin, t. 114, f. 4.

Deshayes, Traité Elem., t. 2, f. 15—18. Dillwyn, Disc. Cat., p. 1090.

Jay, Catalogue, 4th edit., p. 9.

Hab.—Tranquebar, Pondichery, etc.*

Coll. Acad. Nat. Sciences.

Description.—Valves covered by a brown epidermis, solid in texture, very convex, narrow, being two and one-half times longer than their width; in this respect differing very much from the other species of the family. Anterior auricle extending about one-third the total length, with its basal margin very oblique and long, and its dorsal margin short and declining; lateral anterior side sharply angulated by the junction of the dorsal and basal margins. Posterior auricle very small, consisting of a mere triangular lateral swelling of the margin, appearing in some specimens like a tooth. Beaks very narrow, much raised, and tuberculate.

Internally the fang is deeply and narrowly channelled from the beaks to the ventral tubercle. Apophysis very oblique, curved, turning to the posterior side. Anterior to the central channel the substance of the valve is much thinner.

Externally the anterior area is marked by a few rather coarse concentric striæ. Anterior to the centre of the fang and opposed to the internal channel is a corresponding longitudinal raised rib, which is rather closely transversely striated; posterior to the rib the surface is nearly smooth, with the exception of a few longitudinal striæ, visible on the posterior shoulder.

Length $\frac{1}{2}$ inch; breadth not quite $\frac{1}{4}$ th inch.

Pallels about $\frac{1}{2}$ inch in length, the blade exceeding the style; blade spoon-shaped, concave on one side, convex on the other, and thickened on the convex side to a little above the middle, whence it is depressed to the tip; the depressed area is covered with elegant ribs which radiate to all parts of the upper margin, causing it to be toothed.

Tubes singularly contorted and twisted upon themselves, a mass of them frequently growing together, they are of a light brown or yellowish red color, and very solid, rapidly acuminate from the rounded base to the upper end.

Length four inches; breadth at base three-fourths of an inch, at tip half as much.

Genus XYLOTRYA, Leach.

XYLOTRYA, Leach, MSS. (subgenus.) Adams, Genera, ii. p. 333. Gray, Zool. Proc. p. 188, 1847. Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 381.

Jeffreys, Ann. and Mag. Nat. Hist. 3d ser. vi. p. 125. Menke, Syn.

Meth., 1830. Sowerby, Illust. Brit. Shells.

Xylotrya, Quatrefages, Ann. des Sc. Nat. 3d ser. xi. p. 28.

Bankia, Gray.

Teredo, (part.) Blainville, Dict. Sc. Nat. lii. p. 259. Blainville, Malacol. p.

579. Bosc, Hist. Coq. ii. p. 197. Catlow, Conch. Nomenc. p. 2. Chenu,

Man. ii. p. 12. Cuvier, Regne Anim. edit. Griffith, xii. p. 123. Delle

Chiaje, Mem. iv. Deshayes, Encyc. Meth. p. 1002. Fischer, Journ.

Conchyl. 2d ser. i. Forbes and Hanley, Brit. Moll. i. p. 58. Hanley,

Desc. Cat. p. 3. Home, Phil. Trans., 1806. Lamarck, Anim. Sans.

Vert. edit. 1, v. p. 438; et edit. 2, vi. p. 35. Lamarck, Syst., 1801.

Philippi, Enum. Moll. Sicil. i. p. 2, et ii. p. 3. Spengler, Skrivt. Nat.

ii. pt. 1. Schumacher, Essai d'un Nov. Syst. Thompson, Ann. and

Mag. Nat. Hist., 1847. Turton, Conch. dithyra, p. 13.

* The specimen in Coll. A. N. S. is marked "St. Croix, W. I.," doubtless a mistake.

X. BIPENNATA, Turton.

- X. BIPENNATA, Turton, Conch. Diet. p. 184, f. 38—40. Turton, Conch. dith. Brit. p. 15. Brown, Conch. Gt. Brit. p. 116. Catlow, Conch. Nomenc. p. 2. Fischer, Journ. Conchyl. 2d ser. i. p. 257. Fleming, Brit. Anim. p. 454. Gray, Phil. Mag., 1827, p. 411. Hanley, Desc. Cat. p. 4, t. 9, f. 50. Hanley, Brit. Mollusca, i. p. 80, t. 1, f. 9—11. Jeffreys, Ann. and Mag. Nat. Hist. 3d ser. vi. p. 126. Quatrefages, Ann. des Sc. Nat. 3d ser. xi. p. 30. Thorpe, Brit. Mar. Conch. p. 28.
- X. pennatifera, (part.) Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 386.
- X. carinata, Leach, Adams, Genera, ii. p. 333.
- T. carinata, Leach, Blainville, Dict. Sc. Nat. lii. p. 269. Catlow, Conch. Nomenc. p. 3. Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 368.
- T. carinata, Blainville, Fischer, Journ. Conchyl. 2d ser. i. p. 256.
- T. carinata, Gray, Phil. Mag., 1827, p. 411. Hanley, Desc. Cat. p. 4.
- T. navalis, Home, Philos. Trans., 1806, p. 276. Home, Comparit. Anat. ii. t. 43.

Hab.—England (*bipennata*), a doubtful native. Sumatra (*carinata*). Coll. Acad. Nat. Sciences.

Description.—“Valves with the body or medial portion narrow and elongated. Auricle typically projecting higher than the beaks; its upper internal edge most strongly reflected outwards; the lower internal edge scarcely sloping, and projecting shelf-fashion over the body. Triangular area extending as low down as the auricle, not large, its outer edge very oblique; tooth-like apophysis greatly slanting posteriorwards. Pallets very large, quill-shaped, of a spongy texture.

The shape of the valves is very different from that of *Norvægica* or *Batava*, the medial portion being decidedly more elongated, and the lower end of the auricle slightly more remote from the ventral tubercle than is that of the front triangle. This latter occupies less than two-fifths of an imaginary line drawn from the beaks to the base of the shell, and is concentrically traversed by raised striæ, or narrow lyræ, which are moderately close-set, and not much arcuated below, but more distant and more curved towards the commencement of the series. These are succeeded by another set of minutely decussated striæ, which occupy the narrow strip situated between the lateral triangle and the internal radiating groove, and are produced thence along the front margin of the shell. Then follows a still narrower strip, which, together with the preceding, is elevated towards the beaks above the remainder of the surface, covered with very oblique, distant, raised concentric striæ, often with finer intermediate ones, which, after passing the central, shallow, groove-like, radiating area, are more or less distinctly continued over the remainder of the surface as far as the auricle. This latter, which is smooth, small, and ear-shaped, projects at its upper part above the summit of the beak, and is internally cut off as it were from the body of the shell by its lower edge, which, almost straight and scarcely declining, projects like a ledge over the subumbonal region. Its basal line is thus almost at right angles to the hinder margin, whilst its much arcuated posterior outline runs nearly parallel to the base of the lateral triangle. This ear-shaped appendage is also most strongly reflected outwards, and is internally rather closely grooved with concentric costellæ; its hinder termination is attenuately rounded, and its front extremity is in the adult concavely, in the young subrectilinearly, more or less obliquely subtruncated.

The entire shell is white and faintly glossy; there is an extremely oblique lamina surmounted by a tooth-like process upon the hinge margin, running at acute angles to the very oblique and flat subumbonal blade, which latter is clavate, and in the most perfect specimens we have met with either tubercu-

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lated or jagged at its edge near its termination. Both the posterior and anterior edges of the valves, which are inclined to solidity, are rectilinear, the front being nearly perpendicular, the hinder much more oblique; but in the young these sides are rather more parallel, and the central, or linguiform portion of the shell, much more narrow. The ventral apex is narrow, but not acute, and its internal tubercle rather broad and compressed. The pallets are very curious, and of a sponge-like look and color. They are remarkably large, in some measure resemble a quill in shape, are usually more or less curved, and have their stalk or unbarbed portion most minutely tuberculated. The upper portion, which is usually about one-half of the entire length, and even at its broadest part scarcely wider than the stalk, is closely articulated; the upper and concave edge of each joint terminating at either extremity in an ascending filament, is adorned on one side with a very fine fringe of similar but more minute filaments. The joints towards the extremity appear in the few specimens we have seen to lose their lateral filament, and the concavity of the upper edges so increases as to form a decided angle near their middle.

The tube, which we have not seen ourselves, is declared by Dr. Turton to be thicker and stronger than that of *Norvagia*, and simple in its outer orifice; and by Mr. Gray (1827) to be not concamerated. The diameter of the valves, from which our description was drawn up, is about four-sevenths of an inch, whilst the pallets are actually three inches in length, and about two inches broad at the widest part.

These dimensions, however, especially that of the pallet, are greatly exceeded in the Sumatran examples, from whence we may reasonably conclude that that country is in all possibility its native habitat. Specimens are extremely rare."—*Forbes & Hanley*.

Mr. Jeffreys remarks that "this species requires further investigation, because of the similarity of its valves to those of *T. malleolus*, and of its pallets to those of *T. pennatifera*. The former, however, appear to present a difference in being more arched and solid than in *T. malleolus*, with the anterior auricle larger and having more striæ, as well as in the posterior auricle being usually smaller; and the latter in having a shorter and much thicker stalk than in *T. pennatifera*, which is not annular or tracheiform as in that species, as well as in the lateral filaments being shorter and less slender."

X. cucullata, Norman.

X. cucullata, Norman, MSS. Jeffreys, Ann. and Mag. Nat. Hist. 3d ser. vi. p. 125.

Hab.—In drift fir wood at Guernsey: in teak, with *T. fimbriata* at Belfast.

Description.—"Tube long, thick, not easily detached from the wood, internally wrinkled near the opening. Valves roundish-oval, rather convex; body marked transversely, but regularly, with a few striæ or impressed lines; anterior auricle small, angle obtuse, striæ numerous; posterior auricle dilated and appressed, having its apex nearly on a level with the crown or umbo of the valve, inner edge free and overlapping the body; fang broad; tubercle small; apophysis sickle-shaped. Pallets composed of 20-30 calciform points or cuculli, which are broad on the outer surface, and slightly overlap one another in succession, lateral edges setaceous, with short filaments; stalks cylindrical, of same length as pallet. Dimensions: length (of valves) 8-20"; breadth 6-20".

"The pallets resemble those of *T. minima*, Blainville (*T. palmulata*, Philippi) in having the front margin quite plain; but they differ in the joints being of nearly equal breadth, and (especially in the earlier stage of growth) being much more numerous and compact.

"The pallets of *T. cucullata* are also three or four times as long as those of *T. minima*. The tube and valves of each species are easily distinguishable."—*Jeffreys*.

X. fimbriata, Jeffreys.

X. fimbriata, Jeffreys, Ann. and Mag. Nat. Hist. 3d. ser. vi. p. 126.

X. palmulata,* Forbes and Hanley, British Mollusca, i. p. 86, t. 2, f. 9-11.

Stimpson, Check-List, No. 249. Sowerby, Illust. of Brit. Shells, t. 1, f. 6.

T. bipalmulata, Thompson, Ann. and Mag. Nat. Hist., 1847.

Hab.—A doubtful inhabitant of the British coast.

Description.—The shell of this species differs so little from that of *T. navalis*, that it is difficult to find any important distinctive characters in the valves alone. They appear, however, to be always much smaller than in *navalis*, and the external surface is not so highly polished; the overlapping ledge which internally marks the line of the posterior auricle is more elevated. The valves $\frac{1}{3}$ inch in length. "The pallets, which are extremely fragile, and never attain to any considerable dimensions, closely resemble diminutive specimens of those of *bipennata*. They vary much with age and circumstances in regard to the number of articulations, their closeness or laxity of approach to each other, and even in their individual shapes. In the smaller specimens, (and almost all hitherto taken in our seas belong to this class, not exceeding half an inch in length,) the stem resembles a piece of fine thread, and is about equally long with the broader pinnated portion which surmounts it. This latter is composed of numerous somewhat triangular pieces, of which the narrower end is jointed as it were to the broader opposite extremity of the preceding one, which is more or less deeply incurved in the middle, and has, in consequence, its lateral terminations more or less strongly forked. The basal articulation is often peculiarly graceful in shape, the lateral outline being formed by two convex lines of corresponding curve on either side. The number of these joints may average about a dozen, some apparently having only eight distinct ones, whilst others, (chiefly the larger) have nearly twice that number. The articulated portion is usually about three times as broad as the stalk, and tapers towards its termination, where the joints likewise are smaller and more closely set. In the larger pallets, where the articulations are more remote from each other, their forked extremities, instead of embracing (as in the young) the succeeding joint, project on either side beyond the narrow bases, so as to cause the lateral edges to appear serrated; in certain specimens, where the joints are peculiarly distant, and their subtrigonal forms have become in consequence less distinct, these forked terminations are produced in narrow filaments, and the central concavities are clothed with a more or less fringed membrane, which in some measure conceals the depth of incurvation. . . None of the valves we have seen at all equal the dimensions of our three first species, (*Norvegica*, *marina*, *malleolus*,) and the longest pallet was under two inches in length.

The tube was concamerated in Mr. Clark's examples (*Exmouth*) in the cabinet of Mr. Jeffrey; we confess, however, we perceived no indication of such structure in the very small perforations of the Irish specimens; in both, the testaceous matter was sparingly deposited."—*Hanley*.

X. minima, Blainville, sp.

T. minima, Blainville, Dict. des Sc. Nat. iii. p. 268. Fischer, Journ. Conchyl. 2d ser. i. p. 256. Jeffreys, Ann. and Mag. Nat. Hist. 3d ser. vi. p. 127.

T. bipalmulata, Delle Chiaje, Mem. iv. p. 28, t. 54, f. 18, 22, 23, 24.

T. palmulata, Philippi, Enum. Moll. Sicil. i. p. 3, ii. p. 2, t. 1, f. 8.

T. serratus, Deshayes, Mss.

T. Philippii, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 386. Fischer, Journ. Conchyl. 2d ser. i. p. 257.

X. Philippii, Adams, Genera, ii. p. 333.

* This is not the *T. palmulata* of Lamarek or Philippi.

Hab.—Mediterranean Sea.

Description.—"Coquille à peu près semblable à celle de *T. navalis* mais plus petite, à peu près aussi haute que large; oreillette antérieure portant plus de soixante stries; oreillette postérieure moins abaissée que chez le *T. navalis*.

"Palettes courtes, ressemblant à un petit épi d'orge formées de huit à dix godets courts, comprimés, imbriqués, denticulés à leur bord inférieur et le plus souvent noirâtres. Epines latérales peu développées. Pédicule cylindrique, grêle, blanc, un peu plus long que la palette.

"*Observ.*—Cette charmant espèce n'attient jamais de grandes dimensions, mais ses ravages n'en sont pas moins redoutables; car elle abonde dans les lieux où elle vit."—*Fischer, desc. of T. Philippii*.

Fischer separates *Philippii* from *minima*, and remarks that the latter is described from a young shell. *Jeffreys* unites the two, giving the preference to *Blainville's* name, as the oldest which is not pre-occupied.

X. minima is thus described in *Journ. Conchyl.* p. 256.

"Coquille extrêmement petite, à peu près aussi haute que large; oreillette et zone antérieures plus grandes que les postérieures; stries très nombreuses, presque également, serrées et espacées sur les deux côtés de l'angle antérieur.

"Palettes portées sur un très-long pédicule et formées de douze articulations en godets, non épineuses sur les côtes."—*Fischer*.

X. palmulata, Lamarck (sp.).

Teredo palmulata, Lamarck, *Anim. sans. Vert.* v. p. 440; id. 2d edit. vi. p. 38. *Blainville*, *Man. Malacol.* t. 80, bis, f. 8. *Catlow*, *Conch. Nomenc.* p. 3. *Chenu*, *Man. Conchyl.* ii. f. 64, 65. *Cuvier*, *Regne Anim.* edit. *Griffith*, xii. t. 7, f. 5. *Ferussac*, *Encyc. Meth.* p. 1004. *Fischer*, *Journ. Conchyl.* 2d ser. i. p. 254. *Hanley*, *Desc. Cat.* p. 4, t. 11, f. 13. *Quatrefages*, *An. des Sc. Nat.* 2d ser. xi. p. 29.

X. palmulata, Adams, *Genera*, ii. p. 333, t. 90, f. 6e.

X. bipalmulata, Gray, *Ann. and Mag. Nat. Hist.* 2d ser. viii. p. 386.

T. bipalmulata, Lamarck, *Syst. Anim. sans. Vert.* p. 129. *Bosc*, *Hist. Coq.* ii. p. 202. *Gray*, *Phil. Mag.*, 1827, p. 410.

Taret de Pondichéry, Adanson, *Mem. Acad. des Sc.*, 1759, p. 278, t. 9, f. 12.

Hab.—East Indies.

Description.—The valves and tubes of this species are unknown, and but two specimens of the pallets exist in European collections; from one of these pallets (that in the *Jardin des Plantes*) Lamarck's description is taken,* which in fulness of detail and accuracy is scarcely inferior to the description of *T. navalis*, by *Linnæus*.

The pallets are quite large, the blade composed of twenty or more triangular joints, which are attenuated laterally into sharp projecting points. The stalks are somewhat shorter than the pallets, moderately thick, rounded, and about one-third the width of the blade. Total length about one inch.

Mr. *Jeffreys* remarks that they are "allied to the pallets of *T. bipennata*, although evidently distinct."

This species is not the *T. palmulata* of *Forbes* and *Hanley*, nor of *Philippi*.

X. pennatifera, Blainville (sp.)

Teredo pennatifera, Blainville, *Dict. des Sc. Nat.* lii. p. 269.

X. pennatifera, Adams, *Genera*, ii. p. 333. *Jeffreys*, *Ann. and Mag. Nat. Hist.* 3d ser. vi. p. 126.

X. pennatifera, (part.) *Gray*, *Ann. and Mag. Nat. Hist.* 2d ser. viii. p. 386.

* "*T. palmulis longiusculis, pinnato-ciliatis, subarticulatis.*"—*Lam.*

X. palmulata, Leach, teste Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 386.

Hab.—England, floating wood on the coast of Guernsey (a doubtful native); and at Cherbourg, France.

Description.—"Coquille assez petite et mince, échancrée très anguleusement en avant, finement multistriée; palmules extrêmement considérables, huit ou dix fois plus longues que les valves, composées d'un grand nombre d'articulations, pourvus de chaque côté d'un long cil, et postées sur un long pédicule ce qui les fait ressembler à une pennatule.

"Cette jolie espèce, qui existe . . . dans la collection du Museum Britannique, vient les mers de l'Inde.

"Les palmules pourroient être aisément prises, au premier aspect, pour des pennatules fort élégantes; elles different beaucoup par leur grandeur, et par leur forme de celles du taret des Indes de M. de Lamarck, (*palmulata*, Lam)."—Blainville.

X. Stutchburyi, Leach (sp.).

T. Stutchburyi, Leach, Blainville, Dict. Sc. Nat. iii. p. 268. Fischer, Journ. Conchyl. 2d ser. i. p. 255. Jeffreys, Ann. and Mag. Nat. Hist. 3d ser. vi. p. 127. Quatrefages, Ann. des Sc. Nat. 3d ser. xi. p. 28.

X. Stutchburyi, Gray, Ann. and Mag. Nat. Hist. 2d. ser. viii. p. 386. Adams, Genera, ii. p. 333.

T. campanulata, Deshayes, Mss., Brit. Mus.

T. navalis, Spengler, Skrivt. Nat. ii. p. 100, t. 2, f. 1—3. Schumacher, Essai d'un Nov. Syst. p. 94.

Hab.—Sumatra.

Description.—"Coquille sensiblement moins longue que large; valves fort minces; angle antérieur obtus (115—120°); oreillette antérieure courte, chargée de stries très-fines et très nombreuses; oreillette postérieure assez marquée, mais moins saillante que dans les *Ter. palmulata* et *bipennata*.

"Palettes assez courtes, à pédicules très courts, formées par des godets en partie cornés et demi-transparents, diminuant graduellement du pédoncule au sommet de la palette. Le bord inférieur des godets est épaissi et semble frangé, quand l'individu est fraîchement recueilli ou conservé dans l'alcool. Les godets sont légèrement comprimés, assez profonds; chacun d'eux adhère au bord inférieur de celui qui le précède par un court pédicule.

Obs.—Très-bonne espèce, bien caractérisée par des godets triangulaires, sans épines latérales. Les différentes descriptions que l'on a fait des coquilles, diffèrent par plusieurs points essentiels, et il ne serait pas étonnant qu'il y eût quelques espèces à palettes articulées semblables et à coquilles différentes, comme nous l'avons constaté chez les Tarets à palettes simples."—Fischer.

Subfamily 2. TEREDININÆ, Tryon.

TEREDININÆ, Tryon, Proc. Acad. Nat. Sc. p. 65, 1862.

Genus TEREDINA, Lamarck.

(Fossil.)

Subfamily 3. KUPHINÆ, Tryon.

TEREDINA, (part.), Gray, Zool. Proc. 1847, p. 188.

TEREDININA, (part.), Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 386.

Genus KUPHUS, Guettard.

CUPHUS, Guettard, Mem. iii. p. 139. Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 381.

KUPHUS, Gray, Syn. Br. Mus. 1840. Adams, Genera, ii. p. 648.

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Kyphus, Agassiz.

Furcella, Lamarck, Syst. p. 104, 1801, *note*. Gray, Zool. Proc. pt. 25, p. 243 and pt. 26, p. 258. Gray, Ann. and Mag. Nat. Hist. 3d ser. i. p. 295; and ii. p. 374. Menke, Synops. Meth. edit. 2, p. 122. Oken, Zool.

Septaria, Lamarck, Anim. sans. Vert. v. p. 436; id. edit. 2, vi. p. 32. Anton, Versuch. p. 1. Blainville, Dict. Sc. Nat. xxxii. p. 362. Blainville, Malacol. p. 581. Deshayes, Traite Elem. i. pt. ii. p. 40. Deshayes, Encyc. Meth. iii. p. 246. Hanley, Desc. Cat. p. 3. Latreille, Fam. Nat. Potiez et Michaud, Galerie, ii. p. 271. Rang. Man. p. 349. Schweigg, Natürg. 1820, p. 601. Sowerby, Conch. Man. ed. 2, p. 255. Voigt, Cuv. Thierr. iii. p. 570.

Septana, Fisch. Bibl. Pal. 1834, p. 273, error typ.

Leptana, Gray, Ann. and Mag. N. Hist. 2d ser. viii. p. 386, error typ.

Teredo, (part.), Adams, Genera, ii. p. 333. Catlow, Conch. Nomenc. p. 2. Deshayes, *Note* in Lam. Anim. s. Vert. edit. 2, vi. p. 39. Fischer, Journ. Conchyl. 2d ser. i. p. 132. Home, Philos. Trans. 1806, p. 276. Home, Anat. Comparit. Jay, Cat. 4th edit. p. 9. Wood, Index Test. t. 38.

Serpula, (part.), Linnæus, Syst. Nat. edit. 10, p. 787; and edit. 12, p. 1266. Linnæus, Mus. Ulric. p. 700. Gmelin, Syst. Nat. p. 3739. Hanley, Shells of Linn. p. 446. Pallas, Spicil. Zool. p. 140. Schröter, Einleit. ii.

Solen, (part.), Hebenstr. p. 295. Humphrey, Conch. Klein, De Tub. p. 3. Lesser, Conch. p. 139. Rumphius, Mus.

Clausaria, Menke, Syn. Meth. edit. 1, 1828.

K. arenarius, Linn. sp.

Serpula arenaria, Linnæus, Syst. Nat. ed. 10, p. 787. Linnæus, Mus. Ulric. p. 700. Hanley, Shells of Linnæus, p. 447. Pallas, Spicil. Zool. p. 140.

Solen arenarius, Rumphius, Mus. t. 41, f. d. e, Klein, De Tub. p. 3. Hebenstr. p. 295.

Septaria arenaria, Lamarck, Anim. sans. Vert. v. p. 437; ed. 2, vi. p. 33. Deshayes, Traite Elem. i. pt. 2, p. 44. Hanley, Desc. Cat. p. 3. Potiez et Michaud, Galerie des Moll. ii. p. 271.

Leptana arenaria, Lamarck, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 386, (typo. error.)

Teredo arenaria, Catlow, Conch. Nomenc. p. 2. Gray, Phil. Mag. 1827, p. 410. Jay, Catalogue, 4th edit. p. 9.

Teredo arenarius, Deshayes, *Note* in Lam. Anim. sans Vert. 2d ed. vi. p. 39.

Cuphus arenarius, Gray, Ann. and Mag. Nat. Hist. 2d ser. viii. p. 386. Kuphus arenarius, Adams, Genera, ii. p. 648.

Serpula gigantea, Schröter, Einl. ii. p. 557.

Septaria gigantea, Chenu, Man. de Conchyl. ii. f. 67.

Furcella gigantea, Gray, Zool. Proc. pt. 25, p. 243, t. 39, f. 1—3; id. pt. 26, p. 258; id. Ann. and Mag. Nat. Hist. 3d ser. p. 295; and ii. p. 374.

Teredo gigantea, Home, Philos. Trans. 1806, p. 276, t. 10; and 11, f. 1—7. Home, Anat. Comparit. ii. t. 41. Adams, Genera, ii. p. 333. Dillwyn, Desc. Cat. p. 1087. Fischer, Journ. Conchyl. 2d ser. i. p. 132. Wood, Index Test. t. 38, f. 1.

Serpula polythalamia, Linnæus, Syst. Nat. ed. 12, p. 1266. Gmelin, Syst. Nat. p. 3742. Hanley, Shells of Linnæus, p. 446. Schröter, Einleit. ii. p. 549.

Solen corrugatus, Klein, De Tub. p. 5. Lesser, Conch. p. 139.

Serpula anguina, Var. *B.* Gmelin, Syst. Nat. p. 3743.

Martini, Conch. Cat. 1, p. 40 and 45, t. 1, f. 6, 11.

Davilla, Cat. Syst. p. 97, 102.

Seba, Mus. iii. t. 94.

Hab.—Philippine Islands, Van Dieman's Land, East Indies.

Coll. Acad. Nat. Sciences.

Description.—Valves wanting. Tube contorted somewhat, gradually increasing in diameter to the base, and growing to the length of three feet. The siphonal end is divided into two internal tubes by a transverse partition. External surface roughened, by its contact during growth with surrounding objects, and exhibiting impressions of pebbles, shells, &c. Diameter at base one and a half inch inches, at siphonal end, three-quarters inch. Base rounded, "closed by two overlapping, convex septa, arising from the sides and completely closing the ends. The tube is thickened above as the animal leaves it, and is much thinner near the lower or closed extremity,"* just around which are scattered small perforations for the admission of water to the animal.

Pallets about one inch or more in length, the stalk gradually increasing into a triangular blade, the end of which is truncate on one side and two-horned on the other side.

Oct. 7th.

DR. RUSCHENBERGER in the Chair.

Eighteen members present.

The following paper was presented for publication :

Monograph of the prehensile-tailed *Quadrumana*. By J. H. Slack, M. D.

Mr. Kilvington gave an account of his attempts at cultivating a number of living plants brought by Dr. Hayes from the Arctic region and presented to the Academy. Notwithstanding great care, he had failed in developing the plants to any extent. Though kept in the coolest places, yet the high temperature of our latitude appeared to destroy all after budding and the seeds after germinating. The young plants and seeds were planted in the original soil which accompanied them. They began to perish when the temperature reached 50° F.

Oct. 14th.

MR. CASSIN in the Chair.

Nine members present.

The following paper was presented for publication :

Description of a new species of *Cephalopod*. By W. M. Gabb.

Oct. 21st.

Vice-President VAUX in the Chair.

Seventeen members present.

The following papers were presented for publication :

On the Limits and Affinity of the Family of *Leptoscopoids*, and On the Classification of the *Squali* of California. By Theo. Gill.

Oct. 28th.

Vice-President VAUX in the Chair.

Fourteen members present.

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